

California State University, San Bernardino

CSUSB ScholarWorks

Theses Digitization Project

John M. Pfau Library

2001

Bloom's taxonomy goes high tech: A software review

Lisa Anne Thompson

Follow this and additional works at: <https://scholarworks.lib.csusb.edu/etd-project>



Part of the [Educational Methods Commons](#)

Recommended Citation

Thompson, Lisa Anne, "Bloom's taxonomy goes high tech: A software review" (2001). *Theses Digitization Project*. 3149.

<https://scholarworks.lib.csusb.edu/etd-project/3149>

This Project is brought to you for free and open access by the John M. Pfau Library at CSUSB ScholarWorks. It has been accepted for inclusion in Theses Digitization Project by an authorized administrator of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.

BLOOM'S TAXONOMY GOES HIGH TECH: A SOFTWARE REVIEW

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts
in
Education:
Instructional Technology

by
Lisa Anne Thompson


June 2001

BLOOM'S TAXONOMY GOES HIGH TECH: A SOFTWARE REVIEW


A Project
Presented to the
Faculty of
California State University,
San Bernardino

by
Lisa Anne Thompson
June 2001

Approved by:


Amy S.C. Leh, First Reader

06/07/01
Date


Richard Ashcroft, Second Reader

Copyright 2001 Lisa Anne Thompson

ABSTRACT

This paper presents the details of an intensive software review. Fifty-nine K-6 software programs were reviewed in early 2000. The software was evaluated for correlation to content standards, ease of classroom use, ability to keep the student on task, and student appeal. Activities within each program were reviewed for their placement within Bloom's taxonomy. The author reviewed each piece of software to gather the correlation to content standards and Bloom's taxonomy data. A group of fourteen first through sixth grade students reviewed the software and provided a student appeal rating. The students were observed while using the programs to gather the data concerning time on task and ease of classroom use. Ten programs are presented in the paper as exceptional for school. These ten were chosen because of the large amount of time students spent engaged in and enjoying higher-level thinking and standards based activities while using the program.

ACKNOWLEDGMENTS

I owe many thanks to Dr. Amy Leh for her incredible patience, endless encouragement, and admirable organization. She not only spent hours proofreading and offering suggestions for this project, but she also was constantly an example of an exceptional teacher.

Without the wonderful students at Morongo Valley Elementary School, this project could not have been done. Many of them spent extra hours after school reviewing software and filling out review forms.

Knowledge Adventure also helped this project become possible by donating software.

There are a few people who do not realize the help they gave me during this project. Becky Vilums and Suzanne Conway were two such people. They constantly lent a sympathetic and understanding ear when times were tough and the red tape was never-ending.

Finally, my parents, Dick and Sondra, can never be repaid for their efforts. They have always gone above and beyond to be supportive parents. They were my primary proofreaders for this paper, and they managed to offer advice while remaining a source of encouragement.

DEDICATION

To Travis for reminding me that brilliance is shown not by conformity and perfection, but instead by curiosity and individuality.

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGMENTS	iv
LIST OF TABLES	vii
CHAPTER ONE: INTRODUCTION	
Overview	1
Statement of Problems	2
Goals	4
Significance	4
Limitations	8
Definitions	10
CHAPTER TWO: LITERATURE REVIEW	
Bloom's Taxonomy	12
Bloom's Taxonomy Revised	19
Bloom's Taxonomy and Technology	21
CHAPTER THREE: RESEARCH AND DEVELOPMENT	
Methodology	23
Kid Ratings	25
Time on Task Ratings	26
Bloom's Taxonomy Table	27
Content Standards	28
Software Reviews	29
Software Recommendations	112

CHAPTER FOUR: CONCLUSIONS	123
Recommendations for Future Research	124
APPENDIX A: LIST OF SOFTWARE 'IN ALPHABETICAL ORDER	126
REFERENCES CITED	129

LIST OF TABLES

Table 1.	Bloom's Taxonomy Table	. . . . .	29
Table 2.	Bloom's Taxonomy Table	. . . . .	30
Table 3.	Bloom's Taxonomy Table	. . . . .	31
Table 4.	Bloom's Taxonomy Table	. . . . .	33
Table 5.	Bloom's Taxonomy Table	. . . . .	34
Table 6.	Bloom's Taxonomy Table	. . . . .	35
Table 7.	Bloom's Taxonomy Table	. . . . .	37
Table 8.	Bloom's Taxonomy Table	. . . . .	39
Table 9.	Bloom's Taxonomy Table	. . . . .	40
Table 10.	Bloom's Taxonomy Table	. . . . .	42
Table 11.	Bloom's Taxonomy Table	. . . . .	43
Table 12.	Bloom's Taxonomy Table	. . . . .	44
Table 13.	Bloom's Taxonomy Table	. . . . .	46
Table 14.	Bloom's Taxonomy Table	. . . . .	47
Table 15.	Bloom's Taxonomy Table	. . . . .	48
Table 16.	Bloom's Taxonomy Table	. . . . .	49
Table 17.	Bloom's Taxonomy Table	. . . . .	51
Table 18.	Bloom's Taxonomy Table	. . . . .	52
Table 19.	Bloom's Taxonomy Table	. . . . .	53
Table 20.	Bloom's Taxonomy Table	. . . . .	55
Table 21.	Bloom's Taxonomy Table	. . . . .	56

Table 22.	Bloom's Taxonomy Table	. . . . .	58
Table 23.	Bloom's Taxonomy Table	. . . . .	59
Table 24.	Bloom's Taxonomy Table	. . . . .	61
Table 25.	Bloom's Taxonomy Table	. . . . .	62
Table 26.	Bloom's Taxonomy Table	. . . . .	64
Table 27.	Bloom's Taxonomy Table	. . . . .	65
Table 28.	Bloom's Taxonomy Table	. . . . .	67
Table 29.	Bloom's Taxonomy Table	. . . . .	68
Table 30.	Bloom's Taxonomy Table	. . . . .	69
Table 31.	Bloom's Taxonomy Table	. . . . .	71
Table 32.	Bloom's Taxonomy Table	. . . . .	72
Table 33.	Bloom's Taxonomy Table	. . . . .	73
Table 34.	Bloom's Taxonomy Table	. . . . .	75
Table 35.	Bloom's Taxonomy Table	. . . . .	76
Table 36.	Bloom's Taxonomy Table	. . . . .	77
Table 37.	Bloom's Taxonomy Table	. . . . .	79
Table 38.	Bloom's Taxonomy Table	. . . . .	80
Table 39.	Bloom's Taxonomy Table	. . . . .	82
Table 40.	Bloom's Taxonomy Table	. . . . .	83
Table 41.	Bloom's Taxonomy Table	. . . . .	85
Table 42.	Bloom's Taxonomy Table	. . . . .	86
Table 43.	Bloom's Taxonomy Table	. . . . .	88

Table 44.	Bloom's Taxonomy Table	. . . . .	89
Table 45.	Bloom's Taxonomy Table	. . . . .	91
Table 46.	Bloom's Taxonomy Table	. . . . .	93
Table 47.	Bloom's Taxonomy Table	. . . . .	94
Table 48.	Bloom's Taxonomy Table	. . . . .	96
Table 49.	Bloom's Taxonomy Table	. . . . .	97
Table 50.	Bloom's Taxonomy Table	. . . . .	99
Table 51.	Bloom's Taxonomy Table	. . . . .	100
Table 52.	Bloom's Taxonomy Table	. . . . .	101
Table 53.	Bloom's Taxonomy Table	. . . . .	103
Table 54.	Bloom's Taxonomy Table	. . . . .	105
Table 55.	Bloom's Taxonomy Table	. . . . .	106
Table 56.	Bloom's Taxonomy Table	. . . . .	107
Table 57.	Bloom's Taxonomy Table	. . . . .	109
Table 58.	Bloom's Taxonomy Table	. . . . .	110
Table 59.	Bloom's Taxonomy Table	. . . . .	111

CHAPTER ONE

INTRODUCTION

Overview

Between the 1995-96 school year and the 1998-99 school year, the ratio of students to computers in U.S. schools decreased from 10:1 to 5:1 (CEO Forum, 1999). As schools increase the number of computers in their classrooms, they also begin to search for software for these computers. In the 1997-1998 school year, schools spent \$822 million on software (Schools Change Tech, 1999). Administrators and teachers who are already working overtime to ensure quality, standards-based instruction are now faced with the daunting task of choosing instructional software. This task can be less time consuming with the use of software reviews, especially those that focus on standards and instructional objectives.

The purpose of this project was to create a software review based on instructional standards and the principles of Bloom's taxonomy, which is a classification of levels of thinking. Software was evaluated for its instructional potential, as well as its ability to keep students on

task. A group of students also reviewed the software, gave each product a fun rating, and provided comments on the product. A written review was done for each product, including a list of standards and a graph showing which levels of Bloom's taxonomy were utilized. Finally, a list of recommended software for use with first through sixth graders was developed.

Statement of Problems

Schools in the United States reflect the population as a whole in that they are melting pots supporting a wide variety of students with differing learning abilities, backgrounds, and needs. Teachers constantly strive to meet the needs of all students, but many of them spend a great deal of time frustrated because they think they don't reach some students and bore others. Pull-out programs, in-class assistants, and after school tutoring are all utilized to reach the varied needs of different students, yet teachers and principals still seek more ways to help students master skills and improve problem solving through individualized instruction.

As software programs improve, they may be the next focus for some teachers striving to improve individualized

instruction. In an interview with Educom Review, Alfred Bork, founder of the Educational Technology Center, stated, "Given the large and growing number of people, and the need for lifelong education, the best hope we have for individualizing learning is with the use of the computer, with adequate learning programs." Indeed, research shows that software can improve student achievement (Technology Improves Student, 2000). According to the Lightspan Partnership and the American Association of School Administrators Poll, 78% of teachers have seen an increase in student achievement and performance with the use of computers (Lightspan Partnership and AASA, 1998). With schools demonstrating improvement through the use of technology, the task is no longer to convince teachers that technology is useful, but to help them use it appropriately.

The largest problem in choosing educational software is the abundance of products available and the lack of research on how these products affect learning (Zane & Frazer, 1992). In order for software to improve learning, it must be matched with student learning levels, yet many companies never test their products in the classroom (Hasselbring & Tulbert, 1991). So, even if administrators

and teachers are convinced that software will improve student learning, they are left to decide which software will actually do this.

Goals

The goals of this project were the following:

1. To develop a software evaluation focusing on the educational value of software for school use.
2. To provide teachers and administrators with a review of software based on content standards and levels of thinking.
3. To provide not only a teacher's perspective on software, but also students' perspectives on software.
4. To make recommendations to schools as to which programs may be most useful to meet the needs of a wide variety of students.

Significance

This project was unique in that it looked at software from a teacher's point of view, with input from students in various grades, and with a specific focus on educational value. When software is evaluated, the focus is usually on the technical quality of the program, instead of on the achievement of specific learning

objectives the program provides (Hasselbring & Tulbert, 1991). This project looked solely at educational value, focusing on technical quality only when it had a direct effect on learning. As stated earlier, four components were used to judge each piece: content standards, Bloom's taxonomy, on task time, and student opinion.

In recent years, much attention has been placed on content standards in the classroom. Standardized tests are given each year, with schools often times rewarded for good performance on these tests. In some schools, teachers record standards next to each lesson in their plan books. In others, principals must record what standard is being taught each time they enter a classroom. It is no wonder then that teachers and administrators search for instructional materials that will directly teach and review content standards. In the 1999 CEO Forum report, one recommendation in relation to software is that it be indexed according to standard (CEO Forum, 1999). For these reasons, it is important to include relation to content standards in this software review.

Bloom's taxonomy has long been used to classify learning objectives. Activities are classified according to one of six levels of thinking- knowledge,

comprehension, application, analysis, synthesis, and evaluation, with each level requiring a higher level of critical thinking (Bloom, 1956). In any classroom, teachers may have students who are ready for activities requiring a much higher level of thinking than other students. For instance, in a third grade classroom, some students may still be memorizing multiplication facts, while others are ready to apply their use of multiplication to real-life problems. Software can be used to help students work at their own levels to achieve mastery in a specific area (Goynes, McDonough, & Padgett, 2000). Knowing what level (or levels) of thinking a software program targets can help a teacher choose software that is most appropriate for students in his class.

Although many software programs may contain activities that involve mastery of content standards or the use of critical thinking, an important factor to consider when using software in the classroom is whether or not the students will focus on these activities. Some programs may include these activities, but also include activities that are merely included for "fun." So, although academic components are included in the program,

the student can spend time focused on activities with no educational potential. It may not even be the purpose of the designers that students focus a lot of time on these fun activities, but one can never ensure that software will be used as the designer intended (Nelson & Bueno, 1999). So, for this project, one component of the software evaluation looked at the ease with which students could wander off task. Software that kept students involved in standards-based or critical thinking activities was given a higher "on-task" rating than software that allowed students to engage in play activities.

Along with staying on task while using the computer, it is also important that students are interested and engaged in the program they are using. The personal interests of the students are an important factor in evaluating software (Goynes, McDonough, & Padgett, 2000). In this author's opinion, it is far more effective to teach a student in a way which is fun than it is to force the student to be on task, yet bored or disinterested. Why not let the students have a say? It does not mean that we have to take the program that they like the best and use that one. It simply allows us to see which programs interest them, and then take that into

consideration when making a choice of software. For this reason, each software program in this project was reviewed by at least two students. Their opinions are not meant to represent the thinking of all students but were included as additional information to be taken into consideration along with all other components discussed above.

Limitations

One obvious limitation of this project was that all educational software could not be reviewed. Given the time constraint and the impossibility of ever actually obtaining all current software, choices had to be made. Software choices were made based on popularity among schools and availability. The author tried to use software that was well known to schools and/or created with school use in mind.

A second limitation of this project was that each student involved in the project could not review every software title. Fourteen first through sixth grade students participated, and obviously first graders could not review the same software as sixth graders. The same fourteen students were used throughout the project,

though, so all titles appropriate for a certain grade level were reviewed by the same few students.

A third limitation of this project was that the time on task, Bloom's taxonomy, and content standards information was based solely on the observations and opinions of one person, the author. Although various sources were used to gather background information in each of these areas, the final decision on ratings and information was based on the author's evaluation of each program.

A final limitation of this project was that software was reviewed based on its potential to increase learning, as opposed to being reviewed based on whether or not it actually did increase learning. In order to measure actual increases, testing of students would have to be done before and after software use, which is a separate project in itself. Instead, software was reviewed based on what levels of thinking and standards it could cover if used properly.

Definitions

Analysis - The breakdown of material into its necessary parts and the understanding of how parts are related and organized.

Application - The use of remembered rules, ideas, and methods in situations.

Bloom's taxonomy - A classification system of the goals of the educational system, based on levels of cognitive thought.

Comprehension - The understanding and ability to use, but not necessarily relate to, new situations, materials and ideas that have been communicated.

Evaluation - The use of criteria and standards to judge material or methods for a given purpose.

Higher-level thinking activity - An activity that requires a student to use application, analysis, synthesis, or evaluation.

Knowledge - The recall of material and information.

Lower-level thinking activity - An activity that requires a student to use knowledge or comprehension.

On-task - For this paper, on task will refer to participation in an activity that teaches or reviews a

content standard or participation in an activity that falls within one area of Bloom's taxonomy.

Synthesis - The putting together of parts to make a whole in some unique structure.

These terms will be utilized in the next three chapters as Bloom's taxonomy and technology are discussed. Chapter two will consist of a literature review on Bloom's taxonomy and technology in the classroom. In chapter three, details of the project and reviews of each software program will be presented. Conclusions will be presented in chapter four.

CHAPTER TWO

LITERATURE REVIEW

Bloom's Taxonomy

In 1956, a group of educators published the Taxonomy of Educational Objectives: Book 1 Cognitive Domain, with Benjamin Bloom as the editor. The taxonomy outlined in this book has had a significant impact on the educational system (Anderson & Krathwohl, 2000) and is now widely known as Bloom's Taxonomy.

A taxonomy in general terms is a classification system, and Bloom's taxonomy classifies educational objectives, or the intended learning outcomes of activities. The Bloom's taxonomy with which educators are most familiar specifically classifies cognitive objectives, or those objectives dealing with the recall of knowledge and development of intellect. The main purpose for creating this taxonomy was to improve communication among educators and provide them a basis on which to evaluate learning experiences and the outcomes that take place as a result of these experiences (Bloom et al., 1956).

Educational objectives are stated in terms of an action that must be measurable. It is this action that is evaluated for its placement within Bloom's taxonomy. The action is stated as a verb, and these verbs each fall within a category of Bloom's taxonomy.

According to Bloom's taxonomy, educational objectives fall within six categories - knowledge, comprehension, application, analysis, synthesis, and evaluation in that order. The categories are arranged in this order as somewhat of a hierarchy, with each one involving more critical thinking skills than the one preceding it.

Although the original order was that stated above, there has been some controversy over the years among educators. Many consider synthesis to be the highest level, with evaluation falling just below it. What is of importance though is not necessarily the order in which the last two are placed, but recognition of the fact that each of these two involve skills from each of the four other categories. An activity involving synthesis or evaluation will often involve knowledge, comprehension, application, or analysis skills (Critical thinking, 1998). For this software review, the categories are left in their original order, yet a table is provided for each software title, so that

educators can make specific decisions based on their own interpretations of the taxonomy.

Although associated with schools of the early nineteen hundreds where students had to recite lessons, knowledge was still probably the most common educational objective in American schools in the 1950's (Bloom et al., 1956), and is still widely used today. Basically, activities with knowledge objectives involve remembering, or retrieving information from the long-term memory. Bloom broke the knowledge objectives down into three categories - knowledge of specifics, knowledge of ways and means of dealing with specifics, and knowledge of universals and abstractions in a field (Bloom et al., 1956). Knowledge involves not only the recall of facts, but also the recall of theories and methods needed to solve a problem. Objectives involving knowledge often use verbs such as recognize, recall, identify, state, list, match, and repeat. (Fardouly, 2000; Bloom's taxonomy, 2000; Major categories, 2000)

Though commonly used in schools, a curriculum based solely on knowledge objectives would not provide students with the skills needed to succeed. As Bloom (1956) stated:

Whatever the case in the past, it is very clear that in the middle of the 20th century we find ourselves in a rapidly changing and unpredictable culture. It seems almost impossible to foresee the particular ways in which it will change in the near future or the particular problems which will be paramount in five or ten years. Under these circumstances, much emphasis must be placed in school on the development of generalized ways of attacking problems and on knowledge which can be applied to a wide range of new situations. (p. 40)

Activities that focus on the five higher levels of Bloom's taxonomy (comprehension, application, analysis, synthesis, and evaluation) build the problem-solving skills of which Bloom speaks. Therefore, they are classified, according to the taxonomy, as intellectual abilities and skills (Bloom et al., 1956). Whereas knowledge objectives require simple recall of information, objectives in the other five areas involve true understanding of information and ideas.

The lowest level of the intellectual abilities and skills is comprehension. Comprehension involves understanding in such a way that one can construct meaning from information so that it can be used instead of simply recalled. Bloom (1956) broke comprehension into three categories - translation, interpretation, and extrapolation. Translation involves the transfer of

information from one language or form of communication to another, interpretation involves the ability to explain information in one's own way, and extrapolation involves making inferences and correlations based on the information provided (Bloom et al., 1956). Verbs often associated with comprehension objectives are interpret, translate, classify, summarize, infer, explain, and discuss. (Fardouly, 2000; Bloom's taxonomy, 2000; Major categories, 2000)

The next step in the taxonomy is application. Application is the ability to use ideas, rules, or methods to solve problems. Application may involve two types of problems. The simpler problems are those in which the student will already know what rule or method to use. In more complicated application situations, students will also have to determine which method to use (Anderson & Krathwohl, 2000). In a simpler problem, students might be told that they will have to use long division to answer a problem, whereas in a more complex problem, students would have to read a word problem, decide whether to divide or multiply, and then solve the problem. Verbs associated with application objectives are use, apply, perform,

solve, implement, and experiment. (Fardouly, 2000; Bloom's taxonomy, 2000; Major categories, 2000)

Following application in the taxonomy is analysis, the breakdown of communication in order to clarify it or show its organization. Bloom (1956) broke analysis down into three areas - analysis of elements, analysis of relationships, and analysis of organizational principles. When students are analyzing, they are breaking information down into parts in order to see its organization, determine relevance of its parts, examine connections, and make inferences about the intentions of the author (Anderson & Krathwohl, 2000). Examples of analysis objectives are determining an author's purpose for writing a story or distinguishing facts that are necessary to solve a word problem in math from those that are unnecessary. Verbs associated with analysis are breakdown, categorize, deduce, differentiate, interpret, and distinguish (Fardouly, 2000; Bloom's taxonomy, 2000; Major categories, 2000).

As stated earlier, many think the next level of Bloom's taxonomy, synthesis, should be the highest level. Wherever one chooses to place it, synthesis remains an important objective because of the high level of thinking

required for activities involving it. Synthesis activities often involve skills from all of the levels below it on the taxonomy. Synthesis is the combination of parts to create a whole in some unique way. Bloom (1956) broke synthesis into three parts - production of a unique communication, production of a plan, or proposed set of operations, and derivation of a set of abstract relations. Of importance is the fact that what the student creates is an original piece of work. Examples of synthesis activities are building a bridge according to information learned in physics, or writing a research paper on the effects of acid rain. Verbs associated with synthesis objectives are assemble, build, create, produce, design, model, and devise (Fardouly, 2000; Bloom's taxonomy, 2000; Major categories, 2000).

The highest level of objectives according to Bloom's taxonomy is evaluation. Evaluation is the use of standards and criteria to judge methods for a given purpose. Bloom (1956) broke evaluation into two areas - judgments in terms of internal evidence and judgments in terms of external criteria. It is important to note that not all judgments fall in the category of evaluation, as an important factor for objectives in this area is that the

evaluation process be based on some sort of criteria (Anderson & Krathwohl, 2000). An example of an activity involving evaluation would be determining a grade for ones' own paper based on a rubric and provide reasons for the grade. Verbs used in evaluation objectives are judge, evaluate, critique, support, assess, dispute, and rate (Fardouly, 2000; Bloom's taxonomy, 2000; Major categories, 2000).

Bloom's Taxonomy Revised

Anderson and Krathwohl (2000) recently updated Bloom's taxonomy in their book *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. They look at the taxonomy as having two dimensions, the cognitive process dimension and the knowledge dimension. The cognitive process dimension represents the six categories of Bloom's taxonomy, although knowledge is renamed remember, comprehension is renamed understand, and synthesis is renamed create. This revision also considers create (synthesis) to be the highest level in the taxonomy, just above evaluate.

According to this revised taxonomy, objectives not only fall into one of the six cognitive process

dimensions, they also fall into one of four knowledge dimensions. The four knowledge dimensions are factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge (Anderson & Krathwohl, 2000).

Anderson and Krathwohl's (2000) definitions of the four dimensions are as follows:

Factual knowledge - The basic elements students must know to be acquainted with a discipline or solve problems in it.

Conceptual knowledge - The interrelationships among the basic elements within a larger structure that enable them to function together.

Procedural knowledge - How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.

Metacognitive knowledge - Knowledge of cognition in general as well as awareness and knowledge of one's own cognition. (p.29)

This updated version of Bloom's taxonomy looks at objectives as falling into both a cognitive process category and a knowledge category. There are actually twenty-four ways an objective could be classified instead of just six. For each of the cognitive process categories there are the four knowledge dimensions into which the objective might fall. For example, an objective might fall in the analysis category, but it could then also fall under either the factual, conceptual, procedural, or metacognitive knowledge dimension. The revised taxonomy

sounds complicated, but Anderson and Krathwohl (2000) make it seem rather simple by explaining that each objective has a verb and a noun. The cognitive process category is determined based on the verb and the knowledge dimension is determined based on the noun. For example, the objective "students will solve geometry problems based upon theories learned in the past week" falls into the apply category of the cognitive process dimension and the conceptual knowledge category of the knowledge dimension. Another objective, "students will solve word problems involving long division" falls into the apply category also, but into the procedural knowledge category. In both cases students are applying previously learned knowledge, but in the first case students are applying knowledge of concepts, whereas in the second case students are applying knowledge of a procedure.

Bloom's Taxonomy and Technology

A major purpose for creating Bloom's taxonomy was to provide a basis with which to evaluate educational experiences. Considering the billions of dollars that are being spent on technology for schools (Jones & Paolucci,

1999), it is important to consider technology-based activities as part of these educational experiences.

Even as the educational system was first beginning to sample technology as a teaching and learning tool, researchers were stressing the importance of relating that technology to educational theories such as Bloom's taxonomy. Schwaller (1983) found three components important to the teaching of technology education - learning theory, student needs, and the principles of Bloom's taxonomy. Research has found technology too beneficial to cognitive learning (Jones & Paolucci, 1999) to let it be used as merely a fun extra activity in the classroom. As teachers find themselves trying to integrate technology into their classrooms, they will also find themselves wondering how computers and the software accompanying them can fit into and enhance the teaching that is already taking place. As Bloom's taxonomy has helped teachers plan lessons and assess student performance with other activities in the past forty-five years, it can also be used to guide teachers in their choice of technology that can enhance lessons and influence student performance.

CHAPTER THREE

RESEARCH AND DEVELOPMENT

For this project, fifty-nine software programs were reviewed by the author and by a group of students. Attempts were made to use software that is commonly in use in schools, but because software can be expensive, the availability of software also came into effect. Software that was already owned by the author, could be purchased at a discount, or was donated was also used in the study to help keep the cost of it from becoming exorbitant. Each software program was given a kid rating and a time on task rating. A chart showing which areas of Bloom's taxonomy the program covers, a list of standards covered in the program, and comments from this author are also listed for each program.

Methodology

All software programs used in this study were reviewed first by the author and then by at least two student reviewers. Information gathered from the author's review was used to provide the grade level, Bloom's taxonomy table and content standards information for each program.

After this information was gathered, students were asked to review each program. Students were directed to spend as much time as necessary with each program in order to use each activity embedded in it. They were also asked not to spend too much time on any one activity so that they might use as many programs as possible in the time allotted. Students were given ten minutes with each program in which to explore without any prior instruction from the author. If after ten minutes the students still did not understand how to use the program, the author offered assistance. Once students felt comfortable, they were then left to explore that program again on their own.

Students were observed while using the program. Information gathered during this time was coupled with information gathered during the author's review session to provide the time on task rating. If students were observed spending a large amount of time off task with any one activity, they were asked to move on.

Following the use of each program, students were given paper and asked to give the program a "fun" rating. They were also asked to list their favorite part of the program, their least favorite part of the program, and any suggestions they might have to improve the program.

Kid Ratings

A group of fourteen first through sixth grade students reviewed software for this project. Because some software programs were not appropriate for every grade level, all fourteen students did not review every program. Therefore, the same students in each case did not necessarily provide kid ratings for each program. Each program was reviewed by between two and six students, who then gave it a mark between one and ten based on how much they enjoyed using the program. A rating of one was described to them as "I would only use it again if someone made me" and a rating of ten was described as "I would never get tired of using it." All of the student ratings for a specific program were averaged together to get the kid rating for that program. To help the reader compare the kid ratings to others given by the same children, an average rating for the students that reviewed each program is given. For example, if John and Katie reviewed a program, their ratings were averaged to get the kid rating for that program. Then the ratings for all of the programs that John and Katie reviewed were averaged together so that the reader might compare the rating on

that one program to the average rating that John and Katie gave to other programs.

Time on Task Ratings

The time on task rating is based on the amount of time students will likely spend involved in an activity based on a content standard or based on one of the highest four levels of thinking in Bloom's taxonomy (higher-level thinking activities). This rating was given after the author used each program herself and then observed the students use each program.

A rating of one through five was given to each program. Programs receiving a one rating either do not include any activities based on standards or higher level thinking or they include so many fun activities that students would spend very little time involved in the standards-based or higher-level thinking activities. A two rating was given to programs that include both fun activities and standards-based or higher-level thinking activities. In these programs, students can access either type of activity at any time, so they may spend a significant amount of time off-task. Programs receiving a three rating include both fun and standards-based or

higher-level thinking activities, but fun activities are used as rewards for participating in on task activities and can only be accessed at certain times. A rating of four was given to programs that include all standards-based or higher-level thinking activities. Students would spend all of their time working on these activities, or involved in maneuvering characters in order to do these activities. Programs receiving a five rating contain only activities that are standards-based and require higher-level thinking.

Bloom's Taxonomy Table

The review for each software program contains a small table with each of the levels of Bloom's taxonomy listed. An X is placed in the box next to a level if the program contains an activity that requires use of this level of thinking. The age appropriateness of each program was taken into account when it was reviewed, so the levels of thinking checked pertain to the levels that would be used by a student in one of the grade levels listed for the program. For example, since Franklin's Math was reviewed with a first grader in mind, the levels of thinking listed are those that a first grader might use. A fourth grader

using the program would have a higher amount of prior knowledge, and thus would use lower-level thinking skills.

Content Standards

As this project took place in California, the California Content Standards are listed that are covered by each program. Because listing each single standard that a program covered would have made this paper incredibly long, the grade level, subject, and specific area covered are listed for each program instead. The areas listed refer to the areas listed in the English-Language Arts and Mathematics Content Standards adopted by the California State Board of Education. Copies of these standards can be obtained by contacting the California Department of Education at www.cde.ca.gov/board/.

The software programs that were reviewed are listed here in order of grade level. They are listed in progressive order according to the lowest grade level for which they are appropriate. An alphabetical listing of the programs and their corresponding page numbers can be found in Appendix A.

Software Reviews

Title: James Discovers Math

Publisher: Broderbund

Grade Level: K-1

Kid Rating: 10

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 2

Table 1. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade K Math

Algebra and Functions

Measurement and Geometry

Number Sense

Grade 1 Math

Algebra and Functions

Number Sense

Statistics, Data Analysis and Probability

Comments:

This program has some great sections where primary students explore and practice using geometry and time. The students also enjoyed the program, giving it the highest rating possible. Unfortunately, this program includes a few fun activities, such as videos, that can distract students because they are able to access them at any time instead of just as rewards.

Title: Franklin's Math

Publisher: Sanctuary Woods

Grade Level: K-1

Kid Rating: 6

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 4

Table 2. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade K Math

Number Sense

Measurement and Geometry

Grade 1 Math

Number Sense

Measurement and Geometry

Algebra and Functions

Comments:

Although Franklin is a popular character with some students this age, the students generally were not enthusiastic about the program. Even with its three difficulty ratings, the program was just too simple to keep the students excited.

Title: Clifford's Thinking Adventures

Publisher: Scholastic

Grade Level: K-1

Kid Rating: 10

Kids that rated this gave an average rating of: 9.2

Time on Task Rating: 3

Table 3. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade K Language Arts

Listening and Speaking Strategies- Comprehension

Grade 1 Language Arts

Listening and Speaking Strategies- Comprehension

Grade K Math

Mathematical Reasoning

Grade 1 Math

Mathematical Reasoning

Comments:

Although other programs received the highest rating from students as well, this one was a definite favorite. The first grade reviewers just could not get enough of it. Even though the program does include some activities that are just fun and do not involve a standard, students still tended to focus on all activities. The fun activities are generally given as rewards for doing well in standards-based activities, so students do not spend too much time off task.

Title: Clifford Reading

Publisher: Scholastic

Grade Level: K-1

Kid Rating: 10

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 3

Table 4. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	
Synthesis	X
Evaluation	

Content Standards:

Grade K Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Writing- Organization and Focus

Written and Oral Conventions- Spelling

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Spelling

Comments:

This program is similar in structure to Clifford's Thinking, so it was also a favorite of the students. It does tend to stay with standards-based activities more than Clifford's Thinking. The program gives the students

many types of practice with phonics, all while allowing them to interact with their favorite Clifford characters.

Title: Let's Go Read 1

Publisher: Edmark

Grade Level: K-1

Kid Rating: 8

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 4

Table 5. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade K Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Spelling

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Spelling

Comments:

With its speech recognition abilities, this game has high potential. Unfortunately, the activities are repetitive and tedious; the only difference between many of them is just the letter or sound being practiced. Once the excitement of the microphone wore off, the student reviewers were disinterested in the program.

Title: Big Thinkers 1st Grade

Publisher: Humongous Entertainment

Grade Level: K-1

Kid Rating: 3.5

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 3

Table 6. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade K Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Spelling

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Spelling

Grade K Math

Number Sense

Algebra and Functions

Measurement and Geometry

Mathematical Reasoning

Grade 1 Math

Number Sense

Algebra and Functions

Measurement and Geometry

Mathematical Reasoning

Comments:

This game offers a wide variety of standards-based and critical thinking activities for kindergarten and first graders. Unfortunately, the amount of choices was almost overwhelming for the students, and they did not rate it highly.

Title: Mighty Math Zoo Zillions

Publisher: Edmark

Grade Level: K-2

Kid Rating: 10

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 5

Table 7. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade K Math

Number Sense

Algebra and Functions

Measurement and Geometry

Mathematical Reasoning

Grade 1 Math

Number Sense

Algebra and Functions

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 2 Math

Number Sense

Algebra and Functions

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Comments:

This program not only received high ratings from students, it also kept students on task and challenged. The activities get harder as students succeed at each activity, but students or teachers can also change the level with a task bar. Teachers can click on a button on the task bar and view a list of the topics covered at each level of each activity.

Title: Mighty Math Carnival Countdown

Publisher: Edmark

Grade Level: K-2

Kid Rating: 8

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 5

Table 8. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade K Math

Number Sense

Algebra and Functions

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 1 Math

Number Sense

Algebra and Functions

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 2 Math

Number Sense

Algebra and Functions

Measurement and Geometry

Mathematical Reasoning

Comments:

This program has the same format as Mighty Math Zoo Zillions. It also offers a choice of activities with the same task bar feature as Zoo Zillions. There are no activities on the program that are not based on standards, and it is one of the few primary programs that include activities in the analysis and synthesis areas of Bloom's taxonomy. Although not rated as highly as Zoo Zillions by the students, this program still would be a valuable asset to a primary classroom.

Title: Madeline Thinking Games

Publisher: Creative Wonders

Grade Level: K-2

Kid Rating: 5.5

Kids that rated this gave an average rating of: 6.9

Time on Task Rating: 2

Table 9. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade K Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Comments:

This program was attractive to the female reviewers at first, as Madeline is a favorite character for many of them. Once they began the program though, students became quickly bored with it. Student tended to spend most of their time off task, involved in activities such as decorating Madeline's bedroom.

Title: Danny the Dinosaur

Publisher: Fox Interactive

Grade Level: K-2

Kid Rating: 5.5

Kids that rated this gave an average rating of: 5.6

Time on Task Rating: 5

Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade K Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Communications- Spelling

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Communications- Spelling

Comments:

This game offers great activities for a student who might need help with basic phonics. It keeps students on task, and offers easy to follow directions. The downside of this program is that all activities are knowledge based, so it offers little challenge or excitement for accelerated students.

Title: Just Grandma and Me

Publisher: Broderbund

Grade Level: K-1

Kid Rating: 1.5

Kids that rated this gave an average rating of: 5.6

Time on Task Rating: 1

Table 11. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade K Language Arts

Reading- Concepts About Print, Phonemic Awareness

Grade 1 Language Arts

Listening and Speaking- Comprehension

Reading- Concepts About Print

Comments:

Basically, this program is just a book with extra animation. Students listen to the story and then click on objects to watch them move. The students' suggestion for making it better was to add some activities. The only

activity offered is one in which the students build a sand castle, which offers no educational benefit.

Title: Let's Go Read 2

Publisher: Edmark

Grade Level: K-2

Kid Rating: 1.5

Kids that rated this gave an average rating of: 5.6

Time on Task Rating: 4

Table 12. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade K Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Spelling

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Spelling

Grade 2 Language Arts

Reading- Decoding and Word Recognition

Written and Oral Conventions- Spelling

Comments:

Like Let's Go Read 1, this program offered some initial excitement for students because of the speech recognition. Unfortunately, the students spent more time saying funny things into the microphone and listening to them repeated than they did engaged in the activities. It appears that students might get feedback from the program, such as, "You are not pronouncing the word correctly," but they could say anything when prompted for a word and the game would go on.

Title: I Spy

Publisher: Scholastic

Grade Level: K-2

Kid Rating: 7.7

Kids that rated this gave an average rating of: 7

Time on Task Rating: 4

Table 13. Bloom's Taxonomy Table

Knowledge	
Comprehension	X
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade K Language Arts

Reading- Phonemic Awareness

Grade 1 Language Arts

Reading- Phonemic Awareness, Structural Features of
Informational Materials

Writing- Organization and Focus

Written and Oral Conventions- Spelling

Grade 2 Language Arts

Written and Oral Conventions- Spelling

Comments:

This program offers little in the way of variety.
Students spent most of their time hunting for objects
listed in the rhymes on each page.

Title: Snoopy Campfire Stories

Publisher: Virgin

Grade Level: K-2

Kid Rating: 7.3

Kids that rated this gave an average rating of: 7.5

Time on Task Rating: 1

Table 14. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade K Language Arts

Listening and Speaking- Comprehension

Reading- Concepts About Print, Phonemic Awareness

Grade 1 Language Arts

Listening and Speaking- Comprehension

Reading- Concepts About Print

Grade 2 Language Arts

Reading- Decoding and Word Recognition

Comments:

This program does not offer many standards-based activities and students spent most of their time playing the fun games.

Title: Money Town

Publisher: Davidson

Grade Level: K-3

Kid Rating: 5

Kids that rated this gave an average rating of: 7.5

Time on Task Rating: 4

Table 15. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade K Math

Algebra and Functions

Number Sense

Grade 1 Math

Number Sense

Mathematical Reasoning

Grade 2 Math

Number Sense

Mathematical Reasoning

Grade 3 Math

Mathematical Reasoning

Number Sense

Comments:

This program is a great review of money concepts for primary students. Students can pick one of three levels on each game so that activities fit their learning level. Students did not find the activities particularly exciting, and they gave the program a low rating as a result.

Title: Reader Rabbit Personalized Math Ages 6-9

Publisher: The Learning Company

Grade Level: 1-3

Kid Rating: 10

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 5

Table 16. Bloom's Taxonomy Table

Knowledge	
Comprehension	X
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

First Grade Math

Algebra and Functions

Measurement and Geometry

Number Sense

Mathematical Reasoning

Second Grade Math

Algebra and Functions

Measurement and Geometry

Number Sense

Mathematical Reasoning

Third Grade Math

Algebra and Functions

Measurement and Geometry

Number Sense

Mathematical Reasoning

Comments:

This is an excellent game providing meaningful activities that keep students engaged. The students are offered choices of activities on a map. When they master an activity, it disappears and a new choice appears. This provides students choices, but also keeps them focused. Students are also rewarded during activities by receiving

pieces with which to build a boat later on. The activities can be made harder by the students or can be set up to become harder as students progress.

Title: Magic School Bus Lands on Mars

Publisher: Scholastic

Grade Level: 1-3

Kid Rating: 8.5

Kids that rated this gave an average rating of: 8.2

Time on Task Rating: 1

Table 17. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards

Grade 1 Language Arts

Listening and Speaking- Comprehension

Grade 2 Language Arts

Listening and Speaking- Comprehension

Comments:

Although the students loved this game, it offers little in the way of educational activities. The

characters provide interesting information about Mars, but unless guided by the teacher, students will probably ignore the lectures of the characters and focus on playing the fun games.

Title: Free Willy

Publisher: Sound Source Interactive

Grade Level: 1-3

Kid Rating: 6.9

Kids that rated this gave an average rating of: 6.6

Time on Task Rating: 2

Table 18. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	
Analysis	
Synthesis	X
Evaluation	

Content Standards:

Grade 1 Math

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 2 Math

Statistics and Probability

Mathematical Reasoning

Grade 3 Math

Mathematical Reasoning

Comments:

This program includes one great activity in which students can build a course using trial and error with different angles. Other than that though, the program includes mostly lower level thinking activities.

Title: Kid Phonics 2

Publisher: Knowledge Adventure

Grade Level: 1-3

Kid Rating: 6.5

Kids that rated this gave an average rating of 5.6

Time on Task Rating: 3

Table 19. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,

Decoding and Word Recognition, Vocabulary and Concept Development

Writing- Organization and Focus

Written and Oral Conventions- Spelling

Grade 2 Language Arts

Reading- Decoding and Word Recognition, Vocabulary and Concept Development

Writing- Organization and Focus

Written and Oral Conventions- Spelling

Grade 3 Language Arts

Reading- Decoding and Word Recognition, Vocabulary and Concept Development

Writing- Organization and Focus

Written and Oral Conventions- Spelling

Comments:

Students use their phonics and spelling skills as they explore a Western town in this game. It does offer some activities that are just for fun, such as listening to songs, but students stated that this was their least favorite part of the program, so they did not spend too much time off task.

Title: Get Ready For School Charlie Brown

Publisher: Virgin

Grade Level: 1-3

Kid Rating: 2.5

Kids that rated this gave an average rating of: 5.6

Time on Task Rating: 2

Table 20. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition, Vocabulary and Concept
Development

Written and Oral Conventions- Spelling

Grade 2 Language Arts

Reading- Decoding and Word Recognition, Vocabulary
and Concept Development

Written and Oral Conventions- Spelling

Grade 3 Language Arts

Reading- Decoding and Word Recognition, Vocabulary
and Concept Development

Written and Oral Conventions- Spelling

Comments:

The characters and music are fun on this program, but it offers little to engage the students. They can spend as much time as they like dressing Charlie Brown, which keeps them away from the few standards-based activities on the program.

Title: Arthur's Second Grade

Publisher: Creative Wonders

Grade Level: 1-3

Kid Rating: 9

Kids that rated this gave an average rating of: 5.6

Time on Task Rating: 4

Table 21. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 1 Math

Algebra and Functions

Measurement and Geometry

Number Sense

Mathematical Reasoning

Grade 1 Language Arts

Reading- Phonemic Awareness, Decoding and Word
Recognition, Vocabulary and Concept Development

Grade 2 Math

Algebra and Functions

Measurement and Geometry

Number Sense

Mathematical Reasoning

Grade 2 Language Arts

Reading- Decoding and Word Recognition, Vocabulary
and Concept Development

Grade 3 Math

Algebra and Functions

Measurement and Geometry

Number Sense

Mathematical Reasoning

Grade 3 Language Arts

Reading- Vocabulary and Concept Development

Comments:

The activities on this program are not quite as
excellent as those on programs such as Reader Rabbit Math,

but the students liked it so much it was hard not to recommend it. There are a number of simply fun activities on the second disk included with this program, but they can be avoided by only loading disk one in the classroom.

Title: Magic School Bus Explores the Ocean

Publisher: Scholastic

Grade Level: 1-3

Kid Rating: 8.2

Kids that rated this gave an average rating of: 7.5

Time on Task Rating: 2

Table 22. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 1 Language Arts

Listening and Speaking- Comprehension

Grade 1 Math

Measurement and Geometry

Grade 2 Language Arts

Listening and Speaking- Comprehension

Grade 2 Math

Measurement and Geometry

Grade 3 Language Arts

Listening and Speaking- Analysis and Evaluation of
Oral and Media and Communications

Comments:

Like the other Magic School Bus programs, this one includes little in the way of meaningful activities. It might be a great program if the students used the information from the characters to do a project set up by the teacher, but it is mostly a fun game for the students.

Title: Treasure Mathstorm

Publisher: The Learning Company

Grade Level: 1-3

Kid Rating: 8

Kids that rated this gave an average rating of: 5.6

Time on Task Rating: 4

Table 23. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 1 Math

Algebra and Functions

Mathematical Reasoning

Measurement and Geometry

Number Sense

Statistic, Data Analysis, and Probability

Grade 2 Math

Algebra and Functions

Mathematical Reasoning

Measurement and Geometry

Number Sense

Grade 3 Math

Math

Algebra and Functions

Mathematical Reasoning

Measurement and Geometry

Number Sense

Comments:

This game offers an exciting environment for students as they use math skills to ascend a mountain. All activities are standards-based so no time is spent off task as students engage in the adventure.

Title: Math Blaster 6-9

Publisher: Davidson

Grade Level: 1-3

Kid Rating: 4

Kids that rate this gave an average rating of: 7.5

Time on Task Rating: 5

Table 24. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 1 Math

Algebra and Functions

Mathematical Reasoning

Measurement and Geometry

Number Sense

Statistics, Data Analysis, and Probability

Grade 2 Math

Algebra and Functions

Mathematical Reasoning

Number Sense

Grade 3 Math

Algebra and Functions

Number Sense

Comments:

The repetitive nature of this program led to low ratings from the students. They were asked to do the same type of activity in a different setting many times, and this did not keep them engaged.

Title: Grammar Rock

Publisher: Creative Wonders

Grade Level: 1-5

Kid Rating: 8

Kids that rated this gave an average rating of: 6

Time on Task Rating: 2

Table 25. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 1 Language Arts

Reading- Concepts About Print

Grade 2 Language Arts

Written and Oral Conventions- Grammar

Grade 3 Language Arts

Written and Oral Conventions- Grammar

Grade 4 Language Arts

Written and Oral Conventions- Grammar

Grade 5 Language Arts

Written and Oral Conventions- Grammar

Comments:

The students liked this program, but unfortunately they spent most of their time off task. Tokens were offered for correct answers and the students could use them to play arcade games. They seemed to be able to get them quite easily and then played the arcade games over and over. Students can also spend as much time as they like watching Grammar Rock videos while using this program.

Title: Spell It Deluxe

Publisher: Davidson

Grade Level: 1-6

Kid Rating: 1.5

Kids that rated this gave an average rating of: 5.9

Time on Task Rating: 4

Table 26. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Grammar, Spelling

Grade 2 Language Arts

Reading- Decoding and Word Recognition, Vocabulary
and Concept Development

Written and Oral Conventions- Spelling

Grade 3 Language Arts

Reading- Decoding and Word Recognition, Vocabulary
and Concept Development

Written and Oral Conventions- Spelling

Grade 4 Language Arts

Written and Oral Conventions- Spelling

Grade 5 Language Arts

Written and Oral Conventions- Spelling

Grade 6 Language Arts

Written and Oral Conventions- Spelling

Comments:

This is another program that includes activities involving only lower level thinking skills. It did offer a wide variety of word lists, but students tired of the program quickly.

Title: Word Munchers

Publisher: The Learning Company

Grade Level: 1-6

Kid Rating: 4.8

Kids that rated this gave an average rating of: 7.5

Time on Task Rating: 4

Table 27. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 1 Language Arts

Reading- Concepts About Print, Phonemic Awareness,
Decoding and Word Recognition

Written and Oral Conventions- Grammar
Grade 2 Language Arts

Reading- Decoding and Word Recognition

Written and Oral Conventions- Sentence Structure,
Grammar

Grade 3 Language Arts

Written and Oral Conventions- Grammar

Grade 4 Language Arts

Written and Oral Conventions- Grammar

Grade 5 Language Arts

Reading- Vocabulary and Concept Development

Written and Oral Conventions- Grammar

Grade 6 Language Arts

Written and Oral Conventions- Grammar

Comments:

This is another program that offers good opportunities in basic skill building, yet little in the way of critical thinking. Students are simply asked to "munch" words that fit a clue such as the "verbs."

Title: Math Munchers

Publisher: The Learning Company

Grade Level: 2-6

Kid Rating: 6

Kids that rated this gave an average rating of: 7.3

Time on Task Rating: 4

Table 28. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 3 Math

Measurement and Geometry

Number Sense

Algebra and Functions

Grade 4 Math

Number Sense

Measurement and Geometry

Grade 5 Math

Number Sense

Grade 6 Math

Number Sense

Measurement and Geometry

Comments:

Like the Word Munchers program, this program offers very little for students who are ready for higher level thinking activities. The students got bored with its repetitiveness quite quickly, and were motivated to keep using it only to get the highest score.

Title: Jump Start Second Grade Math

Publisher: Knowledge Adventure

Grade Level: 2-3

Kid Rating: 4.5

Kids that rated this gave an average rating of: 5.6

Time on Task Rating: 5

Table 29. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Second Grade Math

Measurement and Geometry

Number Sense

Third Grade Math

Measurement and Geometry

Number Sense

Mathematical Reasoning

Comments:

This is another excellent primary math program. It was disappointing that the students did not rate it well, as it offers some challenging synthesis-based activities. A point of frustration for the students seemed to be some of the directions. Advanced vocabulary was used in the directions, and this was difficult for second graders to understand.

Title: Thinkin' Things Sky Island Mysteries

Publisher: Edmark

Grade Level: 2-4

Kid Rating: 7

Kids that rated this gave an average rating of: 5.6

Time on Task Rating: 4

Table 30. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 2 Math

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 2 Language Arts

Reading- Decoding and Word Recognition

Written and Oral Conventions- Spelling

Grade 3 Math

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 3 Language Arts

Reading- Decoding and Word Recognition

Written and Oral Conventions- Spelling

Grade 4 Math

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Comments:

This game offers some challenging activities, which definitely helps the program live up to its name. The most challenging part was the directions, and the students required a lot of assistance to use the program. When asked what they would change about the program, students suggested better instructions.

Title: Super Solvers Outnumbered

Publisher: The Learning Company

Grade Level: 2-4

Kid Rating: 9

Kids that rated this gave an average rating of: 7.5

Time on Task Rating: 5

Table 31. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 3 Math

Algebra and Functions

Mathematical Reasoning

Measurement and Geometry

Number Sense

Statistics, Data Analysis, and Probability

Grade 4 Math

Algebra and Functions

Mathematical Reasoning

Measurement and Geometry

Number Sense

Statistics, Data Analysis, and Probability

Comments:

Students search for a villain in a television station while using this program. They must answer procedure and problem-solving based activities to gain clues as to the villains whereabouts so that the station can be saved.

Title: Spellbound

Publisher: The Learning Company

Grade Level: 2-5

Kid Rating: 8.1

Kids that rated this gave an average rating of: 7.5

Time on Task Rating: 3

Table 32. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 2 Language Arts

Reading- Decoding and Word Recognition

Written and Oral Conventions- Spelling

Grade 3 Language Arts

Written and Oral Conventions- Spelling

Grade 4 Language Arts

Written and Oral Conventions- Spelling

Grade 5 Language Arts

Written and Oral Conventions- Spelling

Comments:

This program offers some good opportunities for basic spelling practice. Because of the low level of thinking involved in the activities, it offers little challenge to high achieving students.

Title: Strategy Challenges

Publisher: Edmark

Grade Level: 2-5

Kid Rating: 10

Kids that rated this gave an average rating of: 7.5

Time on Task Rating: 5

Table 33. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 2 Math

Mathematical Reasoning

Grade 3 Math

Mathematical Reasoning

Grade 4 Math

Mathematical Reasoning

Grade 5 Math

Mathematical Reasoning

Comments:

This game was a favorite of the students, and it also encourages them to use critical thinking skills. Students can play three different games from varied parts of the world. All three games involve strategy, and tips are offered from characters in the program. Students can play against another student or against the computer.

Title: Mission THINK

Publisher: The Learning Company

Grade Level: 2-5

Kid Rating: 6

Kids that rated this gave an average rating of: 5.9

Time on Task Rating: 4

Table 34. Bloom's Taxonomy Table

Knowledge	
Comprehension	X
Application	
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 2 Math

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 3 Math

Algebra and Functions

Mathematical Reasoning

Measurement and Geometry

Grade 4 Math

Mathematical Reasoning

Measurement and Geometry

Grade 5 Math

Mathematical Reasoning

Measurement and Geometry

Comments:

In this program, students complete math activities to earn game pieces that they will use in a strategy game

later in the program. The game allows the students to have some fun while maneuvering about to collect pieces, but it is all done in order to complete math-based activities.

Title: Phonics Alive 3 - The Speller

Publisher: Advanced Software

Grade Level: 2-6

Kid Rating: 2.5

Kids that rated this gave an average rating of: 5.9

Time on Task Rating: 4

Table 35. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 2 Language Arts

Written and Oral Conventions- Spelling

Grade 3 Language Arts

Written and Oral Conventions- Spelling

Grade 4 Language Arts

Written and Oral Conventions- Spelling

Grade 5 Language Arts

Written and Oral Conventions- Spelling

Grade 6 Language Arts

Written and Oral Conventions- Spelling

Comments:

This program was quite unappealing to the students as it mostly involved typing in the correct spelling of words grouped by word families. The students advanced whether they spelled the words correctly or not, which kept them unmotivated to succeed.

Title: Magic School Bus Explores the Earth

Publisher: Scholastic

Grade Level: 2-4

Kid Rating: 6

Kids that rated this gave an average rating of: 5.9

Time on Task Rating: 1

Table 36. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 2 Language Arts

Listening and Speaking- Comprehension

Grade 2 Math

Mathematical Reasoning

Grade 3 Language Arts

Listening and Speaking- Comprehension

Grade 3 Math

Mathematical Reasoning

Grade 4 Language Arts

Writing- Research and Technology

Listening and Speaking- Comprehension

Comments:

This program involves mostly listening. There is an experiment-based activity, but the instructions are so poor it is difficult to figure out how to do it.

Title: Cluefinders 4th Grade Adventures

Publisher: The Learning Company

Grade Level: 3-4

Kid Rating: 9

Kids that rated this gave an average rating of: 5.9

Time on Task Rating: 5

Table 37. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 3 Math

Number Sense

Algebra and Functions

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 3 Language Arts

Reading- Vocabulary and Concept Development,

Comprehension and Analysis of Grade-Level-Appropriate Text

Writing- Sentence Structure, Grammar, Punctuation

Grade 4 Math

Number Sense

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 4 Language Arts

Reading- Vocabulary and Concept Development,

Comprehension and Analysis of Grade-Level-Appropriate Text

Writing- Sentence Structure, Grammar

Comments:

This program was long and involved, yet it managed to keep the attention of students with good directions and interesting activities. The students did have to do some similar problems over and over, which they suggested be changed, but overall the students rated it highly. The program has some excellent critical thinking situations and involves activities in numerous subject areas.

Title: Mighty Math Calculating Crew

Publisher: Edmark

Grade Level: 3-6

Kid Rating: 4.5

Kids that rated this gave an average rating of: 6.4

Time on Task Rating: 4

Table 38. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 3 Math

Number Sense

Mathematical Reasoning

Grade 4 Math

Number Sense

Measurement and Geometry

Mathematical Reasoning

Grade 5 Math

Number Sense

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 6 Math

Number Sense

Algebra and Functions

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Comments:

This program is the intermediate program built on the same format as Zoo Zillions and Carnival Countdown. The activities are average as far as thinking skills, and the students did not particularly like it.

Title: Reading Blaster Vocabulary

Publisher: Knowledge Adventure

Grade Level: 3-6

Kid Rating: 9.4

Kids that rated this gave an average rating of: 7.5

Time on Task Rating: 5

Table 39. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 3 Language Arts

Reading- Vocabulary and Concept Development

Grade 4 Language Arts

Reading- Vocabulary and Concept Development

Written and Oral Conventions- Spelling

Grade 5 Language Arts

Reading- Vocabulary and Concept Development

Written and Oral Conventions- Spelling

Grade 6 Language Arts

Reading- Vocabulary and Concept Development

Written and Oral Conventions- Spelling

Comments:

This program includes some terrific opportunities for vocabulary building, as students are involved in solving a mystery. Clues are given as activities are completed, and they are then used to solve the mystery at the end. The mystery changes with each game, so the students can play numerous times and still be challenged.

Title: Carmen San Diego Math Detective

Publisher: The Learning Company

Grade Level: 3-6

Kid Rating: 6

Kids that rated this gave an average rating of: 6.4

Time on Task Rating: 4

Table 40. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	
Synthesis	X
Evaluation	

Content Standards:

Grade 3 Math

Number Sense

Algebra and Functions

Mathematical Reasoning

Grade 4 Math

Number Sense

Algebra and Functions

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 5 Math

Number Sense

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 6 Math

Number Sense

Mathematical Reasoning

Comments:

After using the other Carmen Sandiego programs, this one was a bit of a disappointment. The activities were repetitive and students got bored with the drawn out nature of it. Students also found some of the directions confusing.

Title: How Do You Spell Adventure?

Publisher: Sanctuary Woods

Grade Level: 3-6

Kid Rating: 6.8

Kids that rated this gave an average rating of: 5.9

Time on Task Rating: 4

Table 41. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 3 Language Arts

Reading- Decoding and Word Recognition, Vocabulary
and Concept Development

Written and Oral Conventions- Spelling

Grade 4 Language Arts

Reading- Vocabulary and Concept Development

Writing- Research and Technology

Written and Oral Conventions- Spelling

Grade 5 Language Arts

Reading- Vocabulary and Concept Development

Written and Oral Conventions- Spelling

Grade 6 Language Arts

Reading- Vocabulary and Concept Development

Written and Oral Conventions- Spelling

Comments:

This program involves students in an Indiana Jones type adventure while they practice spelling and vocabulary skills. Unlike the other spelling programs reviewed, it involves more than just knowledge-based activities.

Maneuvering the character is a bit tricky in some situations, which was a bit frustrating for some students.

Title: The Factory

Publisher: Sunburst

Grade Level: 3-6

Kid Rating: 8.5

Kids that rated this gave an average rating of: 6.5

Time on Task Rating: 5

Table 42. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 3 Math

Measurement and Geometry
Statistics, Data Analysis, and Probability

Grade 4 Math

Measurement and Geometry
Mathematical Reasoning

Grade 5 Math

Mathematical Reasoning

Grade 6 Math

Mathematical Reasoning

Comments:

There are some excellent geometry activities on this program that students may never experience anywhere else. Since the whole game is based in a factory where students research, build, ship, and deliver items, most activities involve synthesis, which is uncommon among the games reviewed here.

Title: Cluefinders Reading Adventures

Publisher: The Learning Company

Grade Level: 3-6

Kid Rating: 4

Kids that rated this gave an average rating of: 6.4

Time on Task Rating: 5

Table 43. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 3 Language Arts

Reading- Vocabulary and Concept Development,
Comprehension and Analysis of Grade-Level-Appropriate Text
Written and Oral Conventions- Sentence Structure,
Grammar, Spelling

Grade 4 Language Arts

Reading- Vocabulary and Concept Development,
Comprehension and Analysis of Grade-Level-Appropriate Text
Written and Oral Conventions- Sentence Structure,
Grammar, Spelling

Grade 5 Language Arts

Reading- Vocabulary and Concept Development,
Comprehension and Analysis of Grade-Level-Appropriate Text
Written and Oral Conventions- Sentence Structure,
Grammar, Spelling

Grade 6 Language Arts

Reading- Vocabulary and Concept Development,
Comprehension and Analysis of Grade-Level-Appropriate Text
Written and Oral Conventions- Grammar, Spelling

Comments:

Unlike the Cluefinders' 4th Grade Adventures, this program was just too repetitive for students to find it enjoyable. The activities were great ones, but students just got tired of doing them over and over in order to move on to the next level.

Title: Grammar Games

Publisher: Knowledge Adventure

Grade Level: 3-6

Kid Rating: 7.5

Kids that rated this gave an average rating of: 7.6

Time on Task Rating: 4

Table 44. Bloom's Taxonomy Table

Knowledge	
Comprehension	X
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 3 Language Arts

Writing- Evaluation and Revision

Written and Oral Conventions- Sentence Structure,
Grammar, Punctuation, Capitalization, Spelling
Grade 4 Language Arts

Writing- Evaluation and Revision

Written and Oral Conventions- Sentence Structure,
Grammar, Punctuation, Capitalization, Spelling
Grade 5 Language Arts

Writing- Evaluation and Revision

Written and Oral Conventions- Sentence Structure,
Grammar, Punctuation, Capitalization, Spelling
Grade 6 Language Arts

Written and Oral Conventions- Sentence Structure,
Grammar, Punctuation, Capitalization, Spelling

Comments:

This game contains some great activities in a rainforest setting, with small rewards for students along the way. Students were a bit frustrated with the maneuverability of a toucan needed for one activity, so their ratings were only average.

Title: Mighty Math Number Heroes

Publisher: Edmark

Grade Level: 3-6

Kid Rating: 8.3

Kids that rated this gave an average rating of: 7.6

Time on Task Rating: 5

Table 45. Bloom's Taxonomy Table

Knowledge	
Comprehension	X
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 3 Math

Number Sense

Algebra and Functions

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 4 Math

Algebra and Functions

Number Sense

Measurement and Geometry

Mathematical Reasoning

Grade 5 Math

Algebra and Functions

Measurement and Geometry

Mathematical Reasoning

Grade 6 Math

Algebra and Functions

Measurement and Geometry

Mathematical Reasoning

Comments:

This is another program in the Mighty Math series, so it has many of the same qualities as the others. The movable task bar is still present, and activities are all standards-based. The programs in this series all include a feature where students can switch to an explore mode and create problems of their own. Although this section was somewhat confusing for students, they tended to just switch back if they got there and continue with the other portion of the program.

Title: Trans-Con

Publisher: Lionel Trains

Grade Level: 3-6

Kid Rating: 8.2

Kids that rated this gave an average rating of: 7.5

On Task Rating: 4

Table 46. Bloom's Taxonomy Table

Knowledge	
Comprehension	X
Application	
Analysis	X
Synthesis	X
Evaluation	X

Content Standards:

Grade 3 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text, Narrative Analysis of Grade-Level-
Appropriate Text

Listening and Speaking Strategies- Analysis and
Evaluation of Oral and Media Communications

Grade 4 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text, Narrative Analysis of Grade-Level-
Appropriate Text

Grade 5 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text, Narrative Analysis of Grade-Level-
Appropriate Text

Listening and Speaking Strategies- Analysis and
Evaluation of Oral and Media Communications

Grade 6 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text, Narrative Analysis of Grade-Level-
Appropriate Text

Comments:

This program is incredibly difficult to use, but the activities are excellent and the information included is interesting. The characters are very difficult to move, and the directions in some sections are poor. The program does offer some evaluation activities, which were incredibly rare amongst the programs reviewed.

Title: Logical Journey of the Zoombinis

Publisher: Broderbund

Grade Level: 3-6

Kid Rating: 9.2

Kids that rated this gave an average rating of: 6.6

Time on Task Rating: 5

Table 47. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 3 Math

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 4 Math

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 5 Math

Measurement and Geometry

Mathematical Reasoning

Grade 6 Math

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Comments:

This program had the highest number of critical thinking activities of any program reviewed here. Students are constantly thinking, and never off task. There is little repetition in activities, much to the pleasure of the students. Because it has more than one level, this program works well for many grade levels. There are not really any negative points of the program,

as the directions are excellent and the activities are exceptional.

Title: Field Trip to the Rainforest

Publisher: Sunburst

Grade Level: 4-6

Kid Rating: .6

Kids that rated this gave an average rating of: 5.9

Time on Task Rating: 3

Table 48. Bloom's Taxonomy Table

Knowledge	X
Comprehension	
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

Grade 4 Language Arts

Writing- Research and Technology

Listening and Speaking- Comprehension

Grade 5 Language Arts

Listening and Speaking- Comprehension

Grade 6 Language Arts

Writing- Research and Technology

Comments:

This program was definitely not a favorite of the students. The name leads one to believe he will get to interact with animals in the rainforest, yet it is really just a reference source for rainforest information. The only activity is one where students answer questions based on what they have learned from listening to information about the rainforest in other parts of the program.

Title: Operation Neptune

Publisher: The Learning Company

Grade Level: 4-6

Kid Rating: 7.5

Kids that rated this gave an average rating of: 5.9

Time on Task Rating: 5

Table 49. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 4 Math

Number Sense

Algebra and Functions

Measurement and Geometry

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 5 Math

Number Sense

Algebra and Functions

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 6 Math

Algebra and Functions

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Comments:

This program includes a wide variety of excellent problem solving situations. The problems are based on real problems that might arise if one were on a boat or in a submarine, which students are during the program. Students work with latitude and longitude, miles per hour, and various types of graphs.

Title: Where in the USA is Carmen Sandiego?

Publisher: The Learning Company

Grade Level: 4-6

Kid Rating: 8.5

Kids that rated this gave an average rating of: 6.7

Time on Task Rating: 5

Table 50. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	
Synthesis	X
Evaluation	X

Content Standards:

Grade 4 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Writing- Research and Technology

Grade 5 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Grade 6 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Writing- Research and Technology

Comments:

This program was popular among the students once they figured out how to use it. The directions were tricky, and students needed a lot of help with them. Students also found the questions about the states to be difficult. A nearby U.S. map was almost a necessity when using this program.

Title: Puzzle Tanks

Publisher: Sunburst

Grade Level: 4-6

Kid Rating: 5.5

Kids that rated this gave an average rating of: 6.5

Time on Task Rating: 5

Table 51. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 4 Math

Number Sense

Mathematical Reasoning

Grade 5 Math

Mathematical Reasoning

Grade 6 Math

Mathematical Reasoning

Comments:

Although this game does involve the use of higher level thinking skills, it really only has one activity. Students found the activity almost too difficult and were ready to move on to something else quickly.

Title: Where in the World is Carmen Sandiego?

Publisher: The Learning Company

Grade Level: 4-6

Kid Rating: 9

Kids that rated this gave an average rating of: 6.8

Time on Task Rating: 5

Table 52. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	
Synthesis	X
Evaluation	X

Content Standards:

Grade 4 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Writing- Research and Technology
Grade 5 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Grade 6 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Writing- Research and Technology

Comments:

One feature makes this program much better than
"Where in the USA is Carmen Sandiego?" This program has
the added feature of a database students can search if
they do not know the answer to the question. This
feature, along with better directions than the other
program, makes the program much more effective as a tool
in elementary classrooms.

Title: Sim Safari

Publisher: Maxis

Grade Level: 4-6

Kid Rating: 8.7

Kids that rated this gave an average rating of: 7.6

Time on Task Rating: 4

Table 53. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	X
Synthesis	X
Evaluation	X

Content Standards:

Grade 4 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Grade 4 Math

Number Sense

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 5 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Grade 5 Math

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Grade 6 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Grade 6 Math

Statistics, Data Analysis, and Probability

Mathematical Reasoning

Comments:

This program was chosen for use in this program over the other Sim programs because of its quality directions. Some of the Sim programs have such poor directions that even an adult has difficulty using them without a manual present. Sim Safari, however, has easy to follow directions provided in the game. The students rated it highly and were constantly engaged in higher-level thinking while using it.

Title: Carmen Sandiego Think Quick

Publisher: The Learning Company

Grade Level: 4-6

Kid Rating: 9.5

Kids that rated this gave an average rating of: 7.6

Time on Task Rating: 3

Table 54. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 4 Language Arts

Writing- Research and Technology

Listening and Speaking- Comprehension

Grade 5 Language Arts

Listening and Speaking- Comprehension

Grade 6 Language Arts

Writing- Research and Technology

Comments:

This program was popular with older students, who liked the combination of the quest scenario mixed with an almost game show like feel. Many of the activities are knowledge based though, and students can engage in a number of fun, arcade-like games along their quest.

Title: Grammar For the Real World

Publisher: Knowledge Adventure

Grade Level: 4-6

Kid Rating: 9.7

Kids that rated this gave an average rating of: 7.6

Time on Task Rating: 4

Table 55. Bloom's Taxonomy Table

Knowledge	X
Comprehension	X
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 4 Language Arts

Reading- Vocabulary and Concept Development

Writing- Evaluation and Revision

Written and Oral Conventions- Sentence Structure,
Grammar, Punctuation, Capitalization, Spelling

Grade 5 Language Arts

Writing- Evaluation and Revision

Written and Oral Conventions- Sentence Structure,
Grammar, Punctuation, Capitalization, Spelling

Grade 6 Language Arts

Written and Oral Conventions- Sentence Structure,
Grammar, Punctuation, Capitalization, Spelling

Comments:

The name says it all for this game. Students are involved in lifelike situations as they proofread letters, edit newscasts, and help with advertising in this program. Students take on jobs in the entertainment industry and, upon mastery of the job, get to add them to a resume. As the resume is filled, students get to do extra fun jobs and work toward the ultimate goal of creating a film. The students loved the characters and were very engaged in the activities.

Title: Building Perspectives

Publisher: Sunburst

Grade Level: 4-6

Kid Rating: 4.7

Kids that rated this gave an average rating of: 7.6

Time on Task Rating: 5

Table 56. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade 4 Math

Mathematical Reasoning

Grade 5 Math

Mathematical Reasoning

Grade 6 Math

Mathematical Reasoning

Comments:

This program was very challenging for the students. They were involved in some higher-level thinking as they tried to solve the problems. Unfortunately, the game offered little variety, so students were not excited about using it for long.

Title: Explorers of the New World

Publisher: The Learning Company

Grade Level: 5-6

Kid Rating: 2

Kids that rated this gave an average rating of: 7.6

Time on Task Rating: 2

Table 57. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	
Analysis	
Synthesis	
Evaluation	

Content Standards:

This program does not include any activities other than listening, so students are not directly working with a standard unless the program is used as part of a research project or report.

Comments:

This program would only be useful if it was used as a reference program within a research project. It involves only listening to information about the world's explorers.

Title: Road Adventures USA

Publisher: The Learning Company

Grade Level: 5-6

Kid Rating: 6.5

Kids that rated this gave an average rating of: 6.8

Time on Task Rating: 3

Table 58. Bloom's Taxonomy Table

Knowledge	
Comprehension	X
Application	X
Analysis	X
Synthesis	
Evaluation	

Content Standards:

Grade 4 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Writing- Research and Technology

Grade 4 Math

Number Sense

Mathematical Reasoning

Grade 5 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Grade 5 Math

Mathematical Reasoning

Grade 6 Language Arts

Reading- Comprehension and Analysis of Grade-Level-
Appropriate Text

Writing- Research and Technology

Grade 6 Math

Mathematical Reasoning

Comments:

Like "Where in the U.S.A is Carmen Sandiego?", this program was difficult for students who did not have much U.S geography background. The activities involve higher-level thinking, but the directions are confusing and the questions are simply too hard for elementary school students.

Title: Math Blaster Geometry

Publisher: Knowledge Adventure

Grade Level: 6

Kid Rating: 9.4

Kids that rated this gave an average rating of: 7.6

Time on Task Rating: 4

Table 59. Bloom's Taxonomy Table

Knowledge	
Comprehension	
Application	X
Analysis	X
Synthesis	X
Evaluation	

Content Standards:

Grade Six Math

Measurement and Geometry

Mathematical Reasoning

Comments:

Although a bit too difficult for elementary students, this program offers excellent geometry activities for middle or even high school students. The students liked it despite its difficulty, and they did learn a great deal from using it.

Software Recommendations

Many of the programs that were reviewed in this study were of high quality, and nearly all of them would be good programs for use at home. This study focused on school use though, and in this case ten programs in particular stood out. These ten programs include numerous excellent activities requiring higher level thinking skills, keep students on task, and also received high marks from the students. These programs also include excellent directions, so that students can remain engaged in the program without a great deal of supervision. In general, these ten programs can provide students with a meaningful

learning experience without the need for teacher intervention, so they could be used in a classroom as a learning center while the teacher works with small groups. Because of this, these programs are highly recommended for elementary school classroom use. The programs are listed here in the order in which they appeared in the list included above.

Clifford's Reading

This program is ideal for kindergarten and first grade students who are just beginning to work with consonant and vowel sounds. Students work on phonics activities with Clifford and Emily while moving throughout a town. At each activity, a new character gives directions and then gives the student a ticket once the activity is completed. While some activities require lower-level thinking skills such as matching sounds to letters, others require higher-level thinking skills such as building words. After the students collect six tickets, they get to turn them in to play a fun game. Once the tickets are used, the student must complete more reading activities.

Carnival Countdown

One of the exceptional features of this program is that students remain on-task at all times. They can choose from five activities, but all activities are standards-based and most require the use of higher-level thinking. This program is appropriate for a wide range of ability levels, as some activities have twenty-six levels. A task bar is present for each activity, and students can click on it to adjust the ability level. If students never change the level, the ability level will increase as they succeed. This program often comes in a dual CD package named "Mighty Math K-2". When the program is purchased this way, it comes with the "Zoo Zillions" program, which is also excellent.

Reader Rabbit's Personalized Math Ages 6-9

One unique feature of this program is that all activities are not accessible to the students at all times. Four or five math activities are on the map at a time. Students may choose any of the activities, but once the activity is mastered, it will disappear for a time and a new activity will appear. This forces students to work on all areas, as opposed to just their favorite areas or strong points. This program, like many of the newer

Learning Company products, comes with a second disk called the Personalized Learning Center. The teacher can load this disk on, and it allows her to keep track of student progress. When students first begin the program, they can take a test that assesses their math skills and sets each activity level to match their needs. The student or teacher can also manually set the level of each activity.

Cluefinders 4th Grade Adventures

This program is one of a series of Cluefinders programs that focus on language arts, math, and social studies skills for specific grade levels. Students must complete activities using these skills, and they are then rewarded with clues that help them get to the next level. Instead of being a skill drill type game in which students repeat activities and merely try to earn a certificate or tokens for fun games, this program has students use skills along the way to an ultimate goal of rescuing their friend and saving the world from evil. Students have to repeat each activity enough times to master it, but not so many times that they are bored. Although this program was the only one of the series that was reviewed for the study, it is quite possible that the 3rd, 5th and 6th grade

Cluefinders programs are also excellent and worth trying in the classroom.

Reading Blaster Vocabulary

Many of the upper grade language arts programs focus on lower-level thinking skills, but this one really engages students in some higher-level thinking while helping them practice and build language skills. The setting for this game is a mansion, and students move among the rooms completing activities. When an activity is completed, the student is given a clue to solve a "whodunit" mystery. After all activities are completed, the mystery can be solved. The game can be played numerous times because the clues and suspects change each time. There are a wide variety of activities; some that involve knowledge skills such as matching words and definitions, and others that involve synthesis skills such as building words. All time is spent on task, making this an enjoyable game for students and also an excellent learning tool.

The Factory

This program stands out from the other favorites listed here in that the students do not interact with any characters while using the program. This was the only

program among those reviewed that managed to do this and still keep the student reviewers engaged. The students, one of whom was quite difficult to keep on task, actually had to be pried away from it.

This program focuses entirely on synthesis and analysis skills, so students are not only working on a content standard at all times, they are also engaged in higher-level thinking. The activities involve so much higher-level thinking that even an adult could be challenged at the highest level. The program automatically starts on the easiest level, but it is very easy for students to change the level to match their ability. Unlike other programs, students seemed to be motivated to try this program at a level that was more difficult for them instead of just keeping it at a level that was easy.

Logical Journey of the Zoombinis

Any teacher tired of hearing about Pokemon might find this a welcome addition to the classroom, as it tends to start a frenzy of excitement over its characters. More students reviewed this program than any other because students would watch others try it and beg to use it. The

characters are enticing, the directions are incredibly clear, and the activities are engaging.

To start the program, the students are asked to create sixteen Zoombinis using different eyes, noses, hair, and feet. They then travel with these Zoombinis, trying to help them make it from an island to their new home. Along the way the students must complete activities that allow the Zoombinis to pass through and complete their journey. If students make too many mistakes trying to figure out the task some Zoombinis are lost. Along the journey there are points that require sixteen Zoombinis to pass, so if students make too many mistakes they must return to the island, make more Zoombinis, and repeat the initial activities.

Once the students complete all activities, the Zoombinis reach their destination and can start building homes. The students can then bring more Zoombinis from the island by completing the activities at a harder level. At all levels students are using analysis and synthesis skills, and no time is spent off task.

Where in the World is Carmen Sandiego?

This program not only keeps students involved in higher-level thinking activities, it also provides them

with an insight into many places and cultures throughout the world. Although students interact with many animated characters in the program, they can also access real-life videos from any of the countries they might visit during the game.

At the beginning of this program, the students are sent on a mission to catch a thief. They set out on an adventure to many different countries, where they are given clues as to the thief's whereabouts and identity. They use this information to decide where to travel next and to obtain a search warrant for the criminal. If a clue about a country is given that the students do not understand, they can enter information into a database search engine which will help them gather more related information. For instance, if a clue is given that the criminal is heading to Venice, students can enter Venice into the database search and they will be shown all areas in which the word Venice appears.

This program is exceptional because it combines three important aspects of education. It keeps students involved in critical thinking; it immerses students into different cultures; it provides opportunities to learn basic research skills.

Sim Safari

Although the Sim games are popular for home use, this one is also excellent for school use because of its excellent directions, exceptional synthesis activities, and popularity among students.

Many of the Sim games require a user's guide to figure out, but Sim Safari offers clear directions throughout the program. This makes it possible for students to use it without requiring an excessive amount of help from an adult. Guides are provided in each section of the game to give not only directions, but also advice.

The program includes three sections - the safari, the lodging area, and the village. In the safari area students must add plants, animals, and water to keep the park in balance. A field book is available for reference about food chains, and an ecologist is also available to give advice about the survival of the plants and animals. In the lodging area students must build sleeping and dining areas, pools, and roads. They must also keep vehicles on hand to take guests into the safari. The students travel to the village to hire locals to work in

the lodging area and park. A business manager is available to give hiring and building advice.

Overall this program provides a real-life experience in ecology and business while keeping students on task and thinking.

Grammar for the Real World

This was another of the few programs that combines language arts skills and higher-level thinking. It also gives students a view of how grammar skills might be used in the real world.

Students take on various jobs in an entertainment business scenario while using this program. Each job requires them to use their grammar skills to complete jobs such as editing and creating advertisements. As a job is successfully completed, it is added to the student's resume. After a certain number of jobs are added to the resume, the student is rewarded with an arcade-type game in which she dodges cars to gather donuts for the bosses. After all jobs are completed the student gets to produce her own movie.

The students who reviewed this program found it challenging, yet entertaining. This is a good sign that

it provides a fun scenario while still engaging students in standards-based and higher-level thinking activities.

CHAPTER FOUR

CONCLUSIONS

This project provides teachers and administrators with a list of quality elementary software programs. Because of the focus on higher-level thinking and content standards in today's schools, programs were chosen to be on this list if they kept students engaged in activities focusing on either or both of these areas. Teachers and administrators are now held accountable for teaching all content standards, and software that can help do this is useful.

Although only ten programs were chosen to be on the list at the end of chapter three, this does not rule out any of the other programs that were reviewed. For this reason, grade level, Bloom's taxonomy, content standard, and student appeal information is provided for each program that was reviewed. This allows teachers and administrators to review the information for any of these programs that they may own and decide how to most appropriately use these programs. In order to make this easier, Appendix A lists all programs that were reviewed

in alphabetical order so that the information on them can easily be found within this project.

The list of programs reviewed is by no means a complete list, but is instead a small sample of what is available. A school that already owns software will most likely not find all of its school owned programs reviewed here, but can instead use the information here as a guide when purchasing new software. Hopefully, the information provided here will help teachers use software more meaningfully in their classrooms and inspire them to choose software that will best fit their needs.

Recommendations for Future Research

Because new software will continuously become available, the need for software research and testing will be ongoing. The thought of choosing software can be a daunting task for a teacher or administrator already burdened with numerous responsibilities. To keep testing and research time down, one might begin by narrowing the search to software design by certain companies.

Those looking for good software can focus on a few companies that have provided good software in the past. Although specific software titles are previously listed,

one could also look further to see that many of these titles came from the same companies. Of the ten titles listed, three came from The Learning Company and one came from Broderbund, a division of The Learning Company. Another company with more than one title listed above is Knowledge Adventure. These companies would be a good starting point for an educator looking for software, as the quality of their programs seems to indicate that they may design their programs for school use.

Overall, the findings in this study reveal the wide range of activities and skill levels included in K-6 software. It is important for teachers and administrators to acknowledge this fact and attempt to research software and choose titles that will best fit their instructional needs.

APPENDIX A:

LIST OF SOFTWARE IN ALPHABETICAL ORDER

LIST OF SOFTWARE IN ALPHABETICAL ORDER

Title	Grade Level	Page Number
Arthur's Second Grade	1-3	56
Big Thinkers 1 st Grade	K-1	35
Building Perspective	4-6	107
Carmen San Diego Math Detective	3-6	83
Carmen San Diego Think Quick	4-6	104
Clifford Reading	K-1	32
Clifford's Thinking Adventures	K-1	31
Cluefinders 4 th Grade Adventures	3-4	78
Cluefinders Reading Adventures	3-6	87
Danny and the Dinosaur	K-2	41
Explorers of the New World	5-6	108
The Factory	3-6	86
Field Trip to the Rainforest	4-6	96
Franklin's Math	K-1	30
Free Willy	1-3	52
Get Ready for School Charlie Brown	1-3	54
Grammar for the Real World	4-6	105
Grammar Games	3-6	89
Grammar Rock	1-5	62
How Do You Spell Adventure?	3-6	84
I Spy	K-2	45
James Discovers Math	K-1	29
Jump Start Second Grade Math	2-3	68
Just Grandma and Me	K-2	43
Kid Phonics	1-3	53
Let's Go Read 1	K-1	34
Let's Go Read 2	K-2	44
Logical Journey of the Zoombinis	3-6	94
Madeline Thinking Games	K-2	40
Magic School Bus Explores the Earth	2-4	77
Magic School Bus Explores the Ocean	1-3	58
Magic School Bus Lands on Mars	1-3	51
Math Blaster 6-9	1-3	61
Math Blaster Geometry	6	111
Math Munchers	2-6	66
Mighty Math Calculating Crew	3-6	80
Mighty Math Carnival Countdown	K-2	38
Mighty Math Number Heroes	3-6	90
Mighty Math Zoo Zillions	K-2	36

Mission THINK	2-5	74
Money Town	K-3	48
Operation Neptune	4-6	97
Phonics Alive 3	2-6	75
Puzzle Tanks	4-6	100
Reader Rabbit Personalized Math Ages 6-9	1-3	49
Reading Blaster Vocabulary	3-6	81
Road Adventures USA	5-6	109
Sim Safari	4-6	102
Snoopy Campfire Stories	K-2	46
Spellbound	K-5	72
Spell It Deluxe	1-6	63
Strategy Challenges	2-5	73
Super Solvers Outnumbered	2-4	71
Thinkin' Things Sky Island Mysteries	2-4	69
Trans-Con	3-6	92
Treasure Math Storm	1-3	59
Where in the USA is Carmen San Diego?	4-6	98
Where in the World is Carmen San Diego?	5-6	101
Word Munchers	1-6	65

REFERENCES CITED

- Anderson, L.W. & Krathwohl, D.R. (2001). A Taxonomy for Learning, Teaching, and Assessing. New York: Addison Wesley Longman, Inc.
- Bloom, B.S., et. al. (1956). Taxonomy of Educational Objectives. New York: Longman.
- Bloom's taxonomy. (2000). [Online] Available Internet: <http://www.tecweb.org/eddevel/blooms.html>
- Faye Ong, et. al. (1998). English-Language Arts Content Standards for California Public Schools. California Department of Education.
- Faye Ong, et. al. (1999). Mathematics Content Standards for California Public Schools. California Department of Education.
- Critical thinking is an important issue in education today. (1998). [Online] Available Internet: <http://www.valdosta.peachnet.edu/~whuitt/psy702/cogsys/critthnk.html>
- CEO Forum. (2000). Year 3 STAR Report. [Online] Available Internet: <http://www.ceoforum.org>
- Fardouly, N. (1998) Instructional design of learning materials. [Online] Available Internet: <http://www.fbe.unsw.edu.au/learning/instructionaldesign/materials.htm>
- The future of Learning. (1999). Educom Review, 34(4), 24-30.
- Goyne, J., McDonough, S. & Padgett, D. (2000). Practical guidelines for evaluating educational software. The Clearinghouse, 73(6), 345-348.
- Hasselbring, T. & Tulbert, B. (1991) Improving education through technology. Preventing School Failure, 35(3), 33-37.

Jones, T.H. & Paolucci, R. (1999). Research framework and dimensions for evaluating the effectiveness of educational technology systems on learning outcomes. Journal of Research and Computing, 32(1), 17-27.

Lightspan partnership and AASA conduct nationwide educator poll. (1998). Electronic Education Report, 5(21), 7.

Major categories in the taxonomy of educational objectives. (2000). [Online] Available Internet: <http://faculty.washington.edu/krumme/guides/bloom.html>

Nelson, W. and Bueno, W. (1999). If you build it, they will come, but how will they use it? Journal of Research on Computing in Education, 32(2), 270-286.

Schools change tech spending habits. (1999). Thrust for Educational Leadership, 28(4), 21.

Schwaller, A. (1983). Teaching strategies in technology education. Viewpoints, 120.

Technology improves student performance, SIIA report says. (2000). Electronic Education Report, 7(18), 3-4.

Zane, T. & Frazer, C. (1992) The extent to which software developers validate their claims. Journal of Research on Computing in Education, 24(3), 410-419.